

Amendments to the Claims

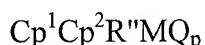
This listing of claims will replace all prior versions and listing of claims in this application.

Listing of claims:

What is claimed is:

Claims 1-21 (**Cancelled**)

22. (**Previously Presented**) A olefin polymerization catalyst composition comprising a metallocene catalyst component characterized by the formula:



wherein:

(a) Cp^1 and Cp^2 are each independently a substituted or unsubstituted cyclopentadienyl derivative incorporating a cyclopentadienyl ring in the form of a substituted or unsubstituted cyclopentadienyl group, a substituted or unsubstituted indenyl group or a substituted or unsubstituted fluorenyl group wherein at least one of the cyclopentadienyl derivatives Cp^1 and Cp^2 incorporate a nitrogen (N) or phosphorus (P) atom in its cyclopentadienyl ring;

(b) R'' is a structural bridge between Cp^1 and Cp^2 imparting stereorigidity to the ligand structure provided that when Cp^1 incorporates a phosphorus atom in its cyclopentadienyl ring and Cp^2 is free of a phosphorus atom in its cyclopentadienyl ring, the bridge R'' is connected to the phosphorus atom in Cp^1 or to a carbon atom in Cp^1 which is distal to the phosphorus atom and further provided that when Cp^1 is a substituted or unsubstituted indenyl group and Cp^2 is a substituted or unsubstituted indolyl group, the bridge R'' is connected to the nitrogen atom of group Cp^2 or to a carbon atom which is vicinal to the nitrogen atom;

(c) M is a transition metal from Group IIIB, Group IVB, Group VB or Group VIB of the Periodic Table of Elements (CAS Version);

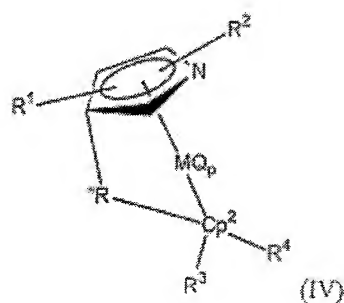
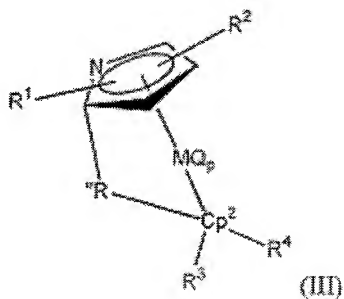
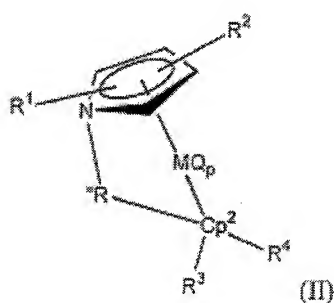
(d) Q is a halogen or a hydrocarbyl group having from 1-20 carbon atoms;
and

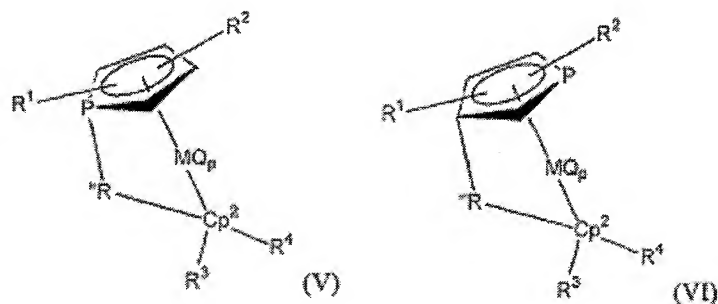
(e) p is equal to the valence of the transition metal M minus 2.

23. **(Previously Presented)** The composition of claim 22 wherein one of Cp^1 or Cp^2 incorporates a nitrogen atom in its cyclopentadienyl ring, and R'' is attached to the nitrogen atom, to a carbon atom vicinal to the nitrogen atom, or to a carbon atom non-vicinal to the nitrogen atom.

24. **(Currently Amended)** The composition of claim 22 in which Cp^1 and Cp^2 are each independently a substituted or unsubstituted cyclopentadienyl group, or a substituted or unsubstituted fluorenyl group, wherein at least one of Cp^1 and Cp^2 incorporate a nitrogen (N) or phosphorus (P) atom in its cyclopentadienyl ring.

25. **(Previously Presented)** The composition of claim 22 wherein the catalyst component is characterized by one of the following formulas (II) – (VI):





wherein R^1 , R^2 , R^3 and R^4 may be the same or different and are selected from the group consisting of a halogen and $C_1 - C_{20}$ alkyl, aryl, cycloalkyl, alkoxy and silanyl groups.

26. **(Currently Amended)** The composition of claim 22 wherein Cp^1 is a substituted or unsubstituted cyclopentadienyl group and Cp^2 is a substituted or unsubstituted fluorenyl group, wherein at least one of Cp^1 and Cp^2 incorporate a nitrogen (N) or phosphorus (P) atom in its cyclopentadienyl ring.

27. **(Currently Amended)** The composition of claim 22 wherein both Cp^1 and Cp^2 comprise indenyl groups, wherein at least one of Cp^1 and Cp^2 incorporate a nitrogen (N) or phosphorus (P) atom in its cyclopentadienyl ring.

28. **(Previously Presented)** The composition of claim 22 wherein M is Ti, Zr, Hf, or V.

29. **(Previously Presented)** The composition of claim 28 wherein p is 2.

30. **(Previously Presented)** The composition of claim 29 wherein Q is Cl.

31. **(Currently Amended)** The composition of claim 22 wherein R'' is substituted or unsubstituted and is selected from the group consisting of an alkylidene group~~alkylene derivative~~ having from 1-20 carbon atoms, a dialkyl germanium group~~derivative~~, a dialkyl silicon

groupderivative, a dialkyl siloxane groupderivative, an alkyl phosphine groupderivative and an amine groupderivative.

32. **(Currently Amended)** The catalyst of claim 31 wherein R" comprises an Me₂Si groupderivative or an Et groupderivative.

33. **(Currently Amended)** The catalyst of claim 22 wherein at least one of the Cp¹ and Cp² derivatives are substituted with substituents which are independently selected from the group consisting of aryl groupsderivatives having from 1-20 carbon atoms, hydrocarbyl groupsderivatives having from 1-20 carbon atoms, cycloalkyls derivatives, silane derivatives, alkoxiesy derivatives and halogens.

34. **(Currently Amended)** The composition of claim 33 wherein said substituents are independently selected from the group consisting of Ph, Bz, Naph, Ind, BzInd, Me, Et, n-Pr, i-Pr, n-Bu, and Me₃Si-Me₂Si.

35. **(Previously Presented)** The composition of claim 34 wherein the substituents are methyl groups.

36. **(Previously Presented)** The composition of claim 22 wherein the metallocene catalyst component is immobilized on a solid support.

37. **(Previously Presented)** The composition of claim 22 further comprising an aluminum- or boron-containing co-catalyst capable of activating the catalyst component.

38. **(Previously Presented)** The composition of claim 22 wherein Cp^1 incorporates a nitrogen or phosphorus atom and is a cyclopentadienyl group or an indenyl group which is substituted or unsubstituted and Cp^2 is a substituted or unsubstituted fluorenyl group.

39. **(Currently Amended)** The composition of claim 38 wherein Cp^1 is a substituted or unsubstituted cyclopentadienyl group and Cp^2 is a fluorenyl group with at least one substituent at the 3- or 6-position, or at the 2- or 7-position, wherein Cp^1 incorporates a nitrogen (N) or phosphorus (P) atom.

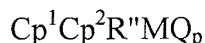
40. **(Previously Presented)** The composition of claim 39 wherein said fluorenyl group is disubstituted with substituents at the 3- and 6-positions or at the 2- and 7-positions.

41. **(Previously Presented)** The composition of claim 40 wherein said substituents are methyl groups.

42. **(Previously Presented)** The composition of claim 22 wherein said catalyst component is selected from the group consisting of: $Me_2Si(pyrrolyl)FluZrCl_2$, $Et(pyrrolyl)FluZrCl_2$, $Me_2Si(imidazolyl)FluZrCl_2$, $Et(imidazolyl)FluZrCl_2$, $Me_2Si(phospholyl)FluZrCl_2$, and $Et(phospholyl)FluZrCl_2$.

43. **(Previously Presented)** A process for the polymerization of an ethylenically unsaturated monomer comprising:

- (a) providing a metallocene catalyst component characterized by the formula:



wherein:

(i) Cp^1 and Cp^2 are each independently a substituted or unsubstituted cyclopentadienyl derivative incorporating a cyclopentadienyl ring in the form of a substituted or unsubstituted cyclopentadienyl group, a substituted or unsubstituted indenyl group or a substituted or unsubstituted fluorenyl group wherein at least one of the cyclopentadienyl derivatives Cp^1 and Cp^2 incorporate a nitrogen (N) or phosphorus (P) atom in its cyclopentadienyl ring;

(ii) R'' is a structural bridge between Cp^1 and Cp^2 imparting stereorigidity to the ligand structure provided that when Cp^1 incorporates a phosphorus atom in its cyclopentadienyl ring and Cp^2 is free of a phosphorus atom in its cyclopentadienyl ring, the bridge R'' is connected to the phosphorus atom in Cp^1 or to a carbon atom in Cp^1 which is distal to the phosphorus atom and further provided that when Cp^1 is a substituted or unsubstituted indenyl group and Cp^2 is a substituted or unsubstituted indolyl group, the bridge R'' is connected to the nitrogen atom of group Cp^2 or to a carbon atom which is vicinal to the nitrogen atom;

(iii) M is a transition metal from Group IIIB, Group IVB, Group VB or Group VIB of the Periodic Table of Elements (CAS Version);

(iv) Q is a halogen or a hydrocarbyl group having from 1-20 carbon atoms; and

(v) p is equal to the valence of the transition metal M minus 2;

(b) providing an activating co-catalyst component;

(c) contacting said metallocene catalyst component and said activating co-catalyst component in a polymerization reaction zone with an ethylenically unsaturated monomer to produce a polymer product by the polymerization of said monomer; and

(d) recovering said polymer product from said reaction zone.

44. **(Previously Presented)** The method of claim 43 wherein said ethylenically unsaturated monomer is ethylene or propylene.

45. **(Previously Presented)** The method of claim 44 wherein said monomer comprises propylene and said polymer product is a polypropylene homopolymer or copolymer.

46. **(Previously Presented)** The method of claim 44 wherein said monomer comprises propylene and said polymer product is a stereoregular polypropylene comprising isotactic and syndiotactic polymer blocks.